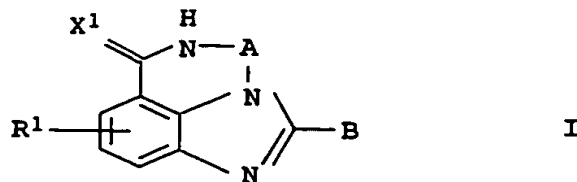


We claim:

1. A compound of the formula I



in which

A can be a C₁-C₃ chain where each carbon atom may also carry one or two of the following substituents: C₁-C₄-alkyl, OH, O-C₁-C₄-alkyl, COOH, COO-C₁-C₄-alkyl and phenyl or one C atom may also carry an =O group, and

X¹ can be S, O and NH, and

R¹ is hydrogen, chlorine, fluorine, bromine, iodine, branched and unbranched C₁-C₆-alkyl, OH, nitro, CF₃, CN, NR¹¹R¹², NH-CO-R¹³, O-C₁-C₄-alkyl, where R¹¹ and R¹² are, independently of one another, hydrogen or C₁-C₄-alkyl, and R¹³ is hydrogen, C₁-C₄-alkyl, C₁-C₄-alkyl-phenyl or phenyl, and

B can be an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 15 carbon atoms, an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 14 carbon atoms and 0 to 5 nitrogen atoms, 0 to 2 oxygen atoms or 0 to 2 sulfur atoms, each of which may also be substituted by one R⁴ and a maximum of 3 different or identical R⁵ radicals, and one or two carbon or sulfur atoms may also carry one or two =O groups, or is a radical L_v-Y-M_w in which

L can be a straight-chain or branched, saturated or unsaturated carbon chain of 1 to 8 C atoms, it being possible for each carbon atom to be substituted by one or two R⁴ radicals and a maximum of two different or identical R⁵ radicals, and

M has, independently of L, the same meaning as L, and

Y is a bond, or can be S, O or NR^3 , where R^3 can be hydrogen, branched and unbranched $\text{C}_1\text{-C}_6\text{-alkyl}$, $\text{C}_1\text{-C}_4\text{-alkyl-phenyl}$, phenyl, and

5 v can be 0 and 1, and

w can be 0 and 1, and

10 when Y is a bond, R^4 and R^5 are not both hydrogen, and

when B is $\text{L}_v\text{-Y-M}_w$, R^1 is not chlorine or NO_2 , and

R^4 is hydrogen and $-(\text{D})_p\text{-(E)}_s\text{-(F}^1)_q\text{-G}^1\text{-(F}^2)_r\text{-(G}^2)\text{-G}^3$, where

15 D can be S, NR^{43} and O

E can be phenyl,

20 $\begin{array}{c} \diagup \\ \text{C}=\text{O}, \\ | \end{array}$ $-\text{SO}_2\text{-}, -\text{SO}_2\text{NH-}, -\text{NHCO-}, -\text{CONH-}, \text{NHSO}_2\text{-},$
 $-\text{NHCOCH}_2\text{X}^4,$
 and

X^4 can be S, O or NH, and

25 F^1 can be a straight-chain or branched saturated or unsaturated carbon chain of 1 to 8 C atoms, and

F^2 has, independently of F^1 , the same meaning as F^1 ,

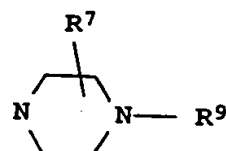
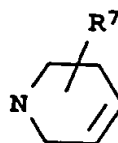
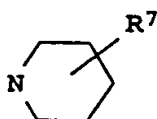
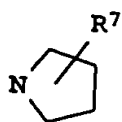
30 G^1 is a bond or can be an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 15 carbon atoms, an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 14 carbon atoms and
 35 0 to 5 nitrogen atoms, 0 to 2 oxygen atoms or 0 to 2 sulfur atoms, each of which may also be substituted by a maximum of 3 different or identical R^5 radicals, and one or two carbon or sulfur atoms may also carry one or two $=\text{O}$ groups, and

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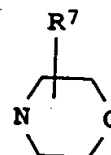
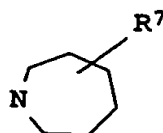
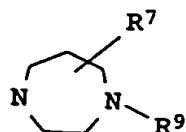
G^2 is $\text{NR}^{41}\text{R}^{42}$ and

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or a bond, and

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G^3 can be an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 15 carbon atoms, an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 14 carbon atoms and 0 to 5 nitrogen atoms, 0 to 2 oxygen atoms or 0 to 2 sulfur atoms, each of which may also be substituted by a maximum of 3 different or identical radicals R^5 , and one or two carbon or sulfur atoms may also carry one or two =O groups, or is hydrogen, and

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p can be 0 and 1 and

s can be 0 and 1 and

30

q can be 0 and 1 and

r can be 0 and 1 and

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R^{41} can be hydrogen, C_1 - C_6 -alkyl, it being possible for each carbon atom also to carry up to two R^6 radicals, phenyl which may also carry a maximum of two R^6 radicals, and $(CH_2)_t$ -K and

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R^{42} can be hydrogen, C_1 - C_6 -alkyl, $-CO-R^8$, CO_2-R^8 , SO_2NH_2 , SO_2-R^8 , $-(C=NH)-R^8$ and $-(C=NH)-NHR^8$ and

R^{43} can be hydrogen and C_1 - C_4 -alkyl and

t can be 1, 2, 3, 4 and

45

K can be $NR^{11}R^{12}$, NR^{11} - C_1 - C_4 -alkyl-phenyl, pyrrolidine, piperidine, 1,2,5,6-tetrahydropyridine, morpholine, homopiperidine, piperazine, which may also be substituted

by an alkyl radical C_1-C_6 -alkyl, and homopiperazine which may also be substituted by an alkyl radical C_1-C_6 -alkyl, and

- 5 R^5 can be hydrogen, chlorine, fluorine, bromine, iodine, OH, nitro, CF_3 , CN, $NR^{11}R^{12}$, $NH-CO-R^{13}$, C_1-C_4 -alkyl- $CO-NH-R^{13}$, COR^8 , C_0-C_4 -alkyl- $O-CO-R^{13}$, C_1-C_4 -alkyl-phenyl, phenyl, $CO_2-C_1-C_4$ -alkyl, and branched and unbranched C_1-C_6 -alkyl, $O-C_1-C_4$ -alkyl, $S-C_1-C_4$ -alkyl, it being possible for each
- 10 C atom of the alkyl chains to carry up to two R^6 radicals, and for the alkyl chains also to be unsaturated, and,
- 15 R^6 can be hydrogen, chlorine, fluorine, bromine, iodine, branched and unbranched C_1-C_6 -alkyl, OH, nitro, CF_3 , CN, $NR^{11}R^{12}$, $NH-CO-R^{13}$, $O-C_1-C_4$ -alkyl,
- 20 R^7 can be hydrogen, C_1-C_6 -alkyl, phenyl, it being possible for the ring also to be substituted by up to two R^{71} radicals, and an amine $NR^{11}R^{12}$ or a cyclic saturated amine which has 3 to 7 members and may also be substituted by an alkyl radical C_1-C_6 -alkyl, and homopiperazine which may also be substituted by an alkyl radical C_1-C_6 -alkyl,
- 25 and where the radicals R^{11} , R^{12} and R^{13} in K, R^5 , R^6 and R^7 may, independently of one another, assume the same meaning as for R^1 , and
- 30 R^{71} can be OH, C_1-C_6 -alkyl, $O-C_1-C_4$ -alkyl, chlorine, bromine, iodine, fluorine, CF_3 , nitro, NH_2 , and
- 35 R^8 can be C_1-C_6 -alkyl, CF_3 , phenyl, C_1-C_4 -alkyl-phenyl, it being possible for the ring also to be substituted by up to two R^{81} radicals, and
- 40 R^{81} can be OH, C_1-C_6 -alkyl, $O-C_1-C_4$ -alkyl, chlorine, bromine, iodine, fluorine, CF_3 , nitro, NH_2 , and
- 45 R^9 can be hydrogen, C_1-C_6 -alkyl, C_1-C_4 -alkyl-phenyl, $CO_2-C_1-C_4$ -alkyl-phenyl, $CO_2-C_1-C_4$ -alkyl, SO_2 -phenyl, COR^8 and phenyl, it being possible for the phenyl rings also to be substituted by up to two R^{91} radicals, and
- 45 R^{91} can be OH, C_1-C_6 -alkyl, $O-C_1-C_4$ -alkyl, chlorine, bromine, iodine, fluorine, CF_3 , nitro, NH_2 ,

and its tautomeric forms, possible enantiomeric and diastereomeric forms, and prodrugs thereof.

2. A compound of the formula I as claimed in claim 1, where

A is a C₂ chain, which may be substituted, and

X¹ is O, and

R¹ is hydrogen.

3. A compound of the formula I as claimed in either of claims 1 or 2, in which

B can be an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 15 carbon atoms, an unsaturated, saturated or partially unsaturated mono-, bi- or tricyclic ring with a maximum of 14 carbon atoms and 0 to 5 nitrogen atoms, 0 to 2 oxygen atoms or 0 to 2 sulfur atoms, each of which may also be substituted by a maximum of 3 different or identical R⁵ radicals, and one or two carbon or sulfur atoms may also carry one or two =O groups.

4. A compound of the formula I as claimed in claim 3, where

B is phenyl, cyclohexyl, piperidine, pyridine, pyrimidine, pyrrole, pyrazole, thiophene, furan, oxazole, naphthalene, piperazine, quinoline, pyrazine, each of which may also be substituted by one R⁴ or a maximum of 2 R⁵.

5. A compound of the formula I as claimed in claim 4, where

R⁴ is hydrogen or D_{0,1}-F¹_{0,1}-G²-G³ with G³ equal to hydrogen, and

D is O and NR⁴³, where R⁴³ is hydrogen and C₁-C₃-alkyl and

F¹ is C₂-C₄-alkyl.

6. A compound of the formula I as claimed in either of claims 1 or 2, in which B is L_v-Y-M_w, where

v is 0, and

W is 1, and

Y is a bond, and

5 M can be a straight-chain or branched carbon chain of 2 to 8 C atoms which contains at least one double bond, it being possible for each carbon atom to be substituted by one or two R⁴ radicals and a maximum of two different or identical R⁵ radicals, and

10 R¹ is hydrogen, and

R⁴ is D_{0,1}-F_{0,1}-G¹-G²-G³, with G³ equal to hydrogen, and

15 D is O and NR⁴³, where R⁴³ is hydrogen and C₁-C₃-alkyl and F¹ is C₂-C₄-alkyl.

20 7. A drug comprising one or more compounds of the formula I as claimed in any of claims 1 to 6 in addition to conventional carriers and excipients.

25 8. The use of compounds of the formula I as claimed in any of claims 1 to 6 or of the formula I where R¹, X¹ and A have the meaning as above, and B can be hydrogen and a C₁-C₆-alkyl chain, for producing drugs with a PARP-inhibiting effect.

30 9. The use of compounds of the formula I as claimed in claim 8 for producing drugs for treating neurodegenerative disorders and neuronal damage.

35 10. The use as claimed in claim 8 for treating neurodegenerative disorders and neuronal damage caused by ischemia, trauma or massive bleeding.

11. The use as claimed in claim 8 for treating stroke and craniocerebral trauma.

40 12. The use as claimed in claim 8 for treating Alzheimer's disease, Parkinson's disease and Huntington's disease.

45 13. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment or prophylaxis of damage due to ischemias.

14. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of epilepsies, in particular of generalized epileptic seizures, such as, for example, petit mal and tonoclonic seizures and partial epileptic seizures, such as temporal lobe, and complex partial seizures.
15. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of damage to the kidneys after renal ischemia, damage caused by drug therapy such as, for example, during cyclosporin therapy, and for treatment during and after kidney transplants.
16. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of damage to the heart following cardiac ischemia.
17. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of microinfarcts such as, for example, during and after heart valve replacement, aneurysm resections and heart transplants.
18. The use of compounds of the formula I as claimed in claim 8 for producing drugs for treatment in cases of revascularization of critically narrowed coronary arteries such as, for example, in PTCA and bypass operations or of critically narrowed peripheral arteries, especially leg arteries.
19. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of acute myocardial infarct and of damage during and after medical or mechanical lysis thereof.
20. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of tumors and metastasis thereof.
21. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of sepsis, of multiorgan failure such as, for example, during septic shock and of acute respiratory distress syndrome.

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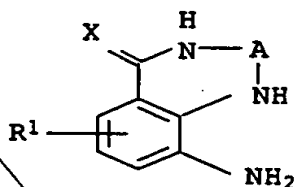
22. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of immunological disorders such as inflammations and rheumatic disorders such as, for example, rheumatoid arthritis.

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23. The use of compounds of the formula I as claimed in claim 8 for producing drugs for the treatment of diabetes mellitus.

24. A compound of the formula III

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III

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in which

20 A is a C₁-C₃ chain it being possible for each carbon atom also to carry one or two of the following substituents: C₁-C₄-alkyl, OH, O-C₁-C₄-alkyl, CO₂H, CO₂-C₁-C₄-alkyl and phenyl or one C atom may also carry an =O group, and

25 X¹ and R¹ have the meanings stated in the previous claims,

excluding the compounds

9-amino-3-methyl-1,2,3,4-tetrahydro-5H-1,4-benzodiazepin-5-one,

30 9-amino-3-methyl-3,4-dihydro-1H-1,4-benzodiazepine-2,5-dione,
6,8-diamino-2,4-(1H,3H)-quinazolinedione,
8-amino-2,4-(1H,3H)-quinazolinedione,

and the salts thereof.

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25. A process for preparing compounds of the formula III and salts thereof, wherein 2-halo-3-nitrobenzoic esters are reacted with a suitable diamine in a polar solvent in the presence of a base, and then the nitro group is hydrogenated with hydrogen in the presence of a suitable catalyst.

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26. The use of compounds of the formula III in the synthesis of PARP inhibitors.

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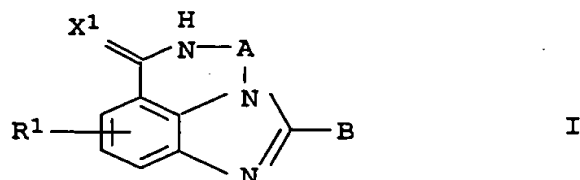
Benzodiazepine derivatives, the preparation and use thereof

Abstract

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The invention relates to compounds of the formula I

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15 and their tautomeric forms, possible enantiomeric and diastereomeric forms, and prodrugs thereof, the preparation and use thereof, where the values have the meaning stated in the description.

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